

Chapter 10 Nuclear Chemistry**Section 10.1 Radioactivity****(pages 292–297)**

This section discusses the different types of nuclear radiation and how they affect matter.

Reading Strategy (page 292)

Previewing Before you read the section, rewrite the topic headings in the table as *how*, *why*, and *what* questions. As you read, write an answer to each question. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Exploring Radioactivity	
Question	Answer
What is nuclear decay?	
	Alpha, beta, gamma

Nuclear Decay (pages 292–293)

1. Describe radioactivity. _____

2. A radioisotope is any atom that contains an unstable _____.
3. Describe what happens to radioisotopes during nuclear decay. _____

Types of Nuclear Radiation (pages 293–296)

4. Nuclear radiation is charged particles and energy that are emitted from the _____ of radioisotopes.
5. Circle the letters that identify each common type of nuclear radiation.
 - a. X-rays
 - b. alpha particles
 - c. beta particles
 - d. gamma rays
6. Circle the letters that identify which groups of particles make up an alpha particle.
 - a. two electrons
 - b. two protons
 - c. two neutrons
 - d. four neutrons

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7. How is the product isotope different from the reactant isotope in alpha decay? _____

8. Circle the letters that identify each event that takes place during beta decay.
- a. A proton decomposes into a neutron and an electron.
 - b. A neutron decomposes into a proton and an electron.
 - c. An electron is emitted from the nucleus.
 - d. A neutron is emitted from the nucleus.
9. Why are beta particles more penetrating than alpha particles?

10. Is the following sentence true or false? All nuclear radiation consists of charged particles. _____
11. What is a gamma ray? _____

12. How fast do gamma rays travel through space?

13. Complete the following table about nuclear radiation.

Characteristics of Nuclear Radiation			
Radiation Type	Charge	Mass (amu)	Usually Stopped By
	-1		
Beta particle		$\frac{1}{1836}$	Aluminum sheet
	0		Several meters of concrete

Effects of Nuclear Radiation (pages 296–297)

14. How does nuclear radiation affect atoms? _____

15. Is the following sentence true or false? One potential danger of radon gas is that prolonged exposure to it can lead to lung cancer.

Detecting Nuclear Radiation (page 297)

16. Name two devices that are used to detect nuclear radiation.
- a. _____
 - b. _____